

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Morency, <i>et al.</i>	Examiner:	Takeuchi
Serial No.:	10/583,183	Art Unit:	4162
Filed:	March 12, 2007		
For:	Hydrometallurgical Separation Process Of Steel Mill Electric Arc Furnace (Eaf) Dust And The Pigments Obtained By The Process		

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**DECLARATION UNDER 37 C.F.R. § 1.132**

I, Dr. Maurice Morency, declare and state as follows:

1. I am a named co-inventor in the above-identified application. I have a Ph.D., and am Vice-President, Research and Development, of the assignee, Ferrinov Inc.
2. I am familiar with the claims, and have read the Office Action mailed September 10, 2009, in the above-identified application. I am also familiar with the response concurrently being filed with the present Declaration in reply to the outstanding Office Action.
3. In the present response, comparative data was discussed in the form of a Table and in the form of nine Photographs which were submitted as attachments. The data were based on the following experiments which were conducted under my supervision and/or control.
4. **For Table 1:** EAF dust was mixed with water. For each container, a different surfactant was added while measuring several properties of the slurry until saturation at a

minimum viscosity value was obtained. As noted in Table 1, the viscosity, pH, and conductivity were measured. For B99 #77 EAF dust source, the minimum viscosity attainable was significantly lower for sodium metaphosphate than for any of the other surfactants tested with that EAF dust source. For B99 #78 EAF dust source, the minimum viscosity attainable was significantly lower for Calgon phosphate surfactant than for any of the other surfactants tested with that EAF dust source. Table 1 contains the operating conditions employed for each run. It should also be noted that two different EAF dust sources were used for these tests as shown in Table 1 (B99 #77 and B99 #78). Though EAF dust sources may vary, the results shown in Table 1 still show that phosphate surfactant allows a remarkably lower minimum viscosity than any of the other surfactants.

5. **For Photographs 1-5:** EAF dust was mixed with water in a glass container forming a slurry mixture. The same quantity and origin of EAF dust was used for each test. For Photographs 1-3 and 5, a different surfactant was added to each container and the mixture was mechanically agitated and then left to decant over time. For Photograph 4, no surfactant was used. The Photographs were taken to show the calcium deposition on the inner surface of the glass containers in the case of the non-phosphate surfactants, the level of turbidity or clarity of the supernatant liquid, and the volume of the settled phase.

Photographs 1a-1b show the effect of a sulfonate surfactant (from the Saratan surfactant family supplied by Handy Chemicals, Ltd.) after 5 days of decantation. Photograph 1b shows the deposits on the glass when the container in Photograph 1a was tipped on its side.

Photographs 2a-2b show the effect of a different sulfonate surfactant (from the Disal surfactant family supplied by Handy Chemicals, Ltd.) after 5 days of decantation.

Photographs 2b shows the deposits on the glass when the container in Photograph 2a was tipped on its side.

Photograph 3 shows the effect of methanol surfactant after 3 days of decantation.

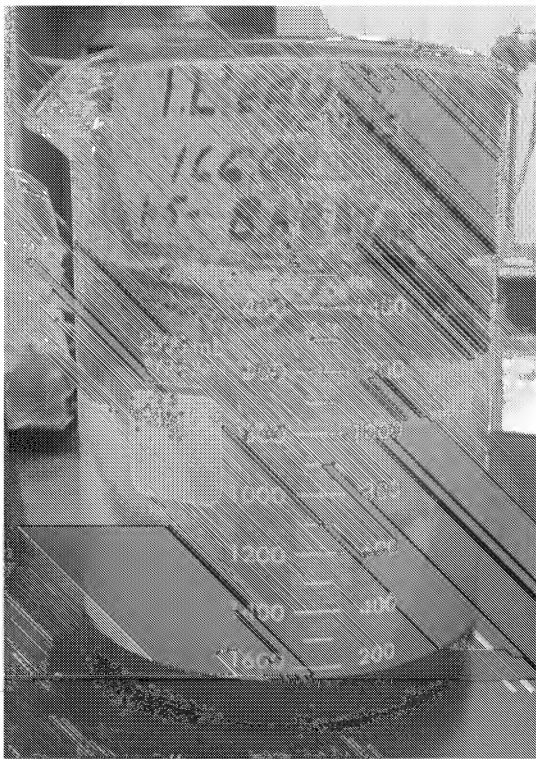
Photographs 4a-4b show the effect of no surfactant after 3 and 6 days of decantation, respectively.

Photographs 5a-5b show the effect of a phosphate surfactant (sodium metaphosphate) after 3 and 6 days of decantation, respectively.

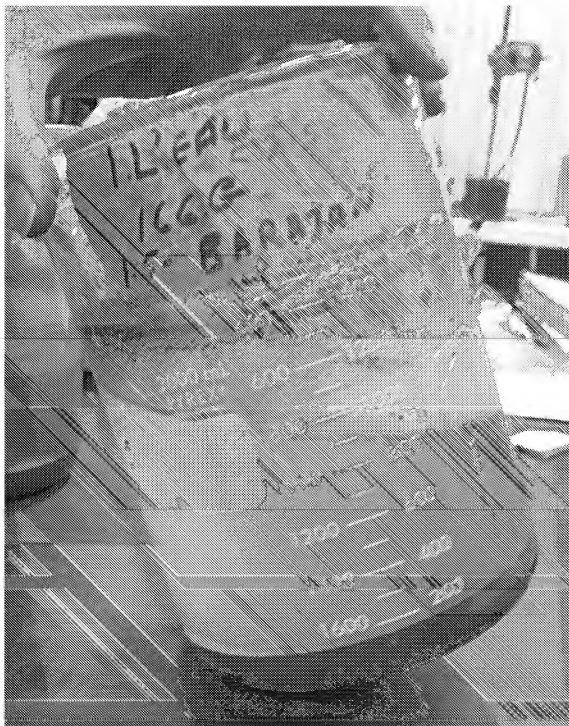
6. **For Photograph 6:** A pilot hydrometallurgical process as described in the application was conducted without any surfactant and with a phosphate surfactant (sodium metaphosphate). The filtering screens for pigment separation were removed from the line and photographed to show that the phosphate surfactant can reduce or eliminate deposition and clogging.

Table 1

Slurry No.	Surfactant	Viscosity (cps)	Zeta (mV)	pH	Conductivity
B99 #77	Sodium metaphosphate 100g/l	80	-41.4	7.43	484
B99 #77	MIP 100 g/l	120	-47.8	8.61	476
B99 #77	Disal 1,01%	440	-30.9	7.16	569
B99 #77	Hanpol 2,53%	280	-18.5	7.32	513
B99 #77	Meladyne 0,92%	440	-29.3	7.36	476
B99 #77	Megapol 0,69%	240	-16.1	7.05	360
B99 #77	Percol H24 0091	800	-24.5	7.18	432
B99 #77	EPF 37%	4000	-18.5	7.28	518
B99 #78	Calgon 100g/l 0,2%	240	-39.6	7.21	506
B99 #78	Saratan 40g/l 0,049%	600	-27.7	7.27	382
B99 #78	Map 0,02%	560	-31.7	7.27	492
B99 #78	Ac. Sulfonibenz 0,06%	720	6	7.22	472
B99 #78	Zetag 7692 0,0002%	540	-28.1	7.12	346
B99 #78	Bicarbonate 0,06%	680	-30.8	7.12	426
B99 #78	Surfinol 0,37%	600	-19.4	6.7	343
B99 #78	Envirogem 0,57%	600	-25.6	6.6	345
B99 #78	Tamol 850 0,49%	280	-52	6.6	498
B99 #78	Tamol 731 0,61%	520	-23.3	6.7	444
B99 #78	Dodecylpyridinium 0,03%	840	-24.6	6.6	369
B99 #78	Solsperse20000 0,61%	320	-34.4	6.7	358



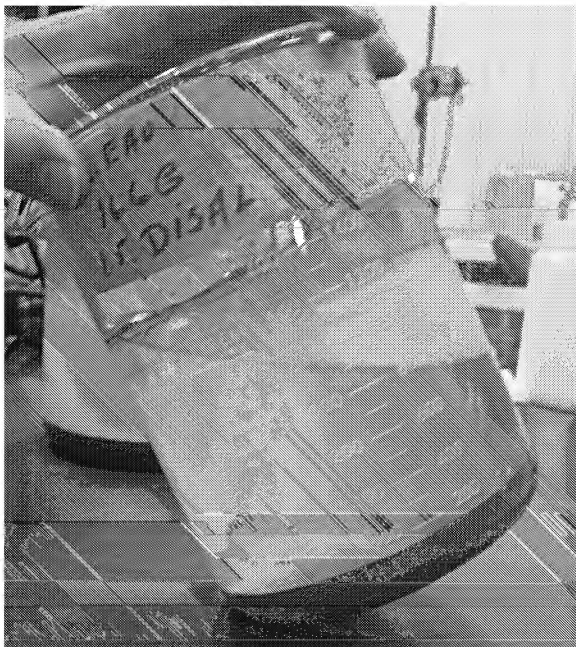
**Photograph 1a – Saratan surfactant (5 day s decantation)**



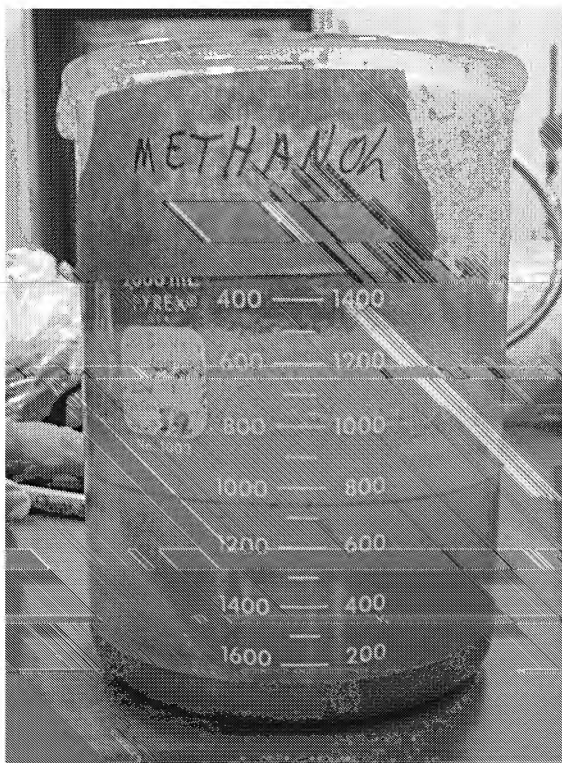
**Photograph 1b – Saratan surfactant (5 days decantation – tipped)**



**Photograph 2a – Disal surfactant (5 days decantation)**



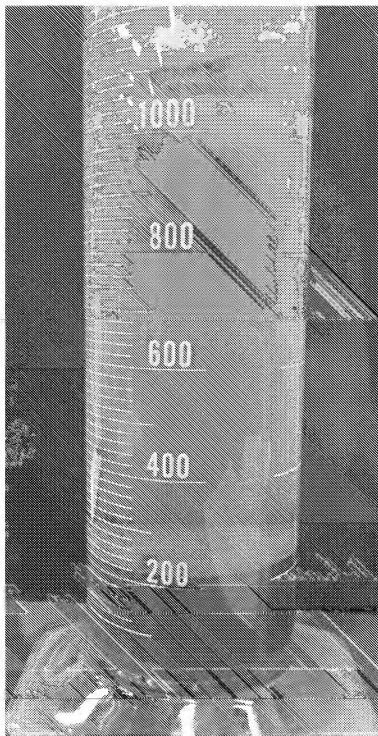
**Photograph 2b – Disal surfactant (5 days decantation – tipped)**



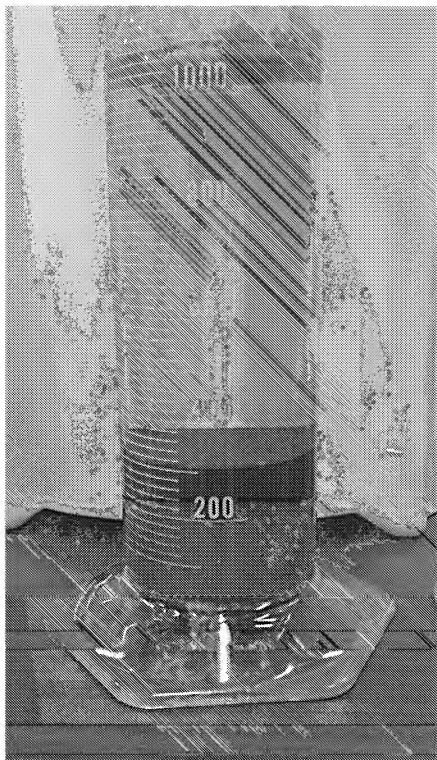
**Photograph 3 – Methanol surfactant (3 days decantation)**



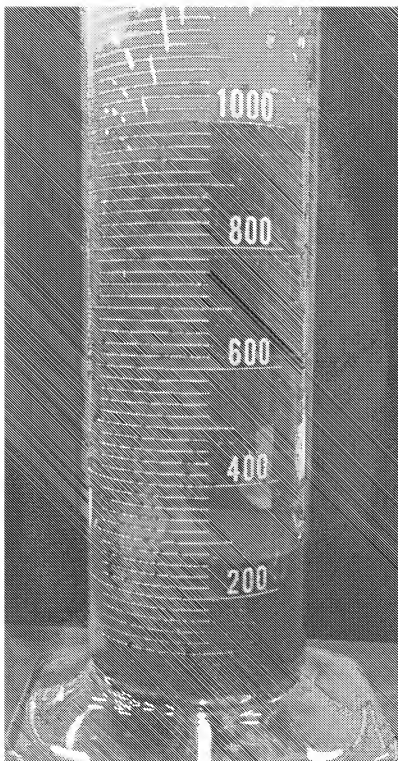
**Photograph 4a – No surfactant (3 days decantation)**



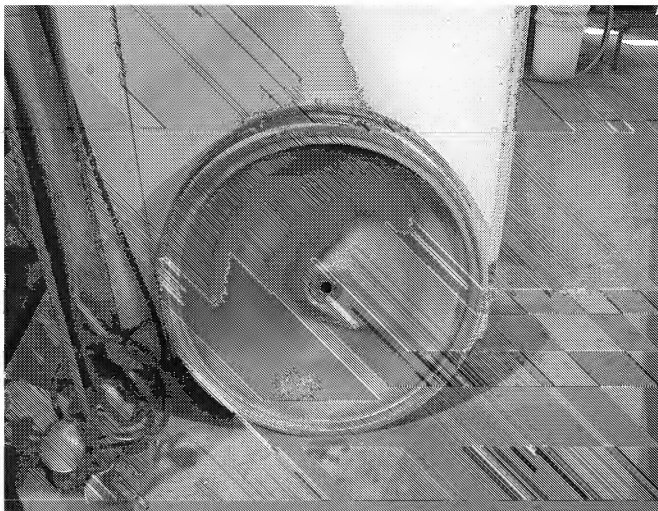
**Photograph 4b – No surfactant (6 days decantation)**



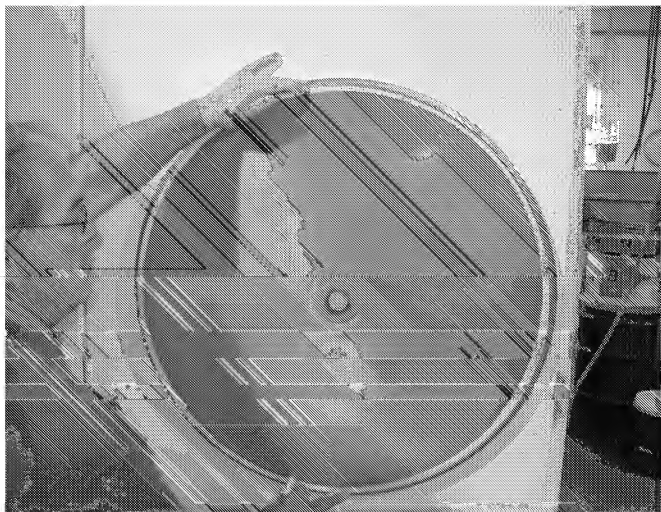
**Photograph 5a – Phosphate surfactant (3 days decantation)**



**Photograph 5b – Phosphate surfactant (6 days decantation)**



**Photograph 6a – Screen without phosphate surfactant**



**Photograph 6b – Screen with phosphate surfactant**

7. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.



Signature

8/03/2010  
Date